

CORPORATIONS AND ENVIRONMENTAL ISSUES

DANA CODRUȚA DUDĂ DĂIANU , DENISA ABRUDAN
“AUREL VLAICU” UNIVERSITY OF ARAD, Romania, WEST UNIVERSITY OF
TIMISOARA, Romania,
cddaianu@yahoo.com, denisa.abrudan@e-uvt.ro

Abstract: *Through this research we aim to bring to the forefront of the broad sphere of environmental protection the concern of large international corporations in this regard, namely those in the automotive industry, focusing in a concrete way on a reputable company, respectively Toyota. As analysis methods are used the analysis and synthesis of data and information, induction or deduction, but also the case study and the comparative study, respectively. Beyond the narrative component of this study, it will also include a numerical component, based on the sales of "green" cars launched by Toyota, in the context of the European market, starting with 2015 and ending with April 2020. As research methods In this sense, the absolute deviations, the relative deviations and the increase / decrease rate will be used.*

Key words: *environmental protection, foreign direct investment , EU auto industry, Pearson Coefficient, economic development*

JEL Classification: Q57, O30

1. Toyota Company and the issue of environmental protection

Toyota is one of the three largest Asian carmakers that compete with US manufacturers in the world market, the other two being Honda Motor and Nissan Motors. Toyota also owns a majority stake in Daihatsu and Hino, and 8.7% of Fuji Heavy Industries, a Subaru carmaker.

The cars produced are sold under the names Toyota, Scion and Lexus. Scion is part of a Toyota category that operates only in the United States. Lexus is the brand through which Toyota produces luxury cars. In the United States, Lexus is in the top sales of luxury cars. Since the introduction of the brand in 1989, Lexus has earned a reputation as a seller of reliable products and quality customer service. The first automobile company in the world to implement hybrid technology on its cars was Toyota, in series production, repeatedly ranked first in the "Top 20 Greenest Brands."

A hybrid vehicle is a vehicle that runs on more than one type of energy. The term is often used for vehicles equipped with electric motors as well as combustion engines. Cererea mare de pe piață pentru astfel de autoturisme, a fost principalul motiv pentru începerea producției de hibridi pentru pasageri, din cauza prețurilor ridicate la petrol și îmbunătățirea constantă a pretențiilor de performanță de mediu pentru autovehicule. High market demand for such cars has been the main reason for the start of production of passenger hybrids, due to high oil prices and the constant improvement of

environmental performance requirements for cars. In addition to all this, improved technology and tax incentives, the production of hybrid vehicles in some cases are even cheaper than regular vehicles.

The advantages of hybrid cars are the following: they make less noise like a heat engine; respond faster to commands; have greater autonomy than a simple electric vehicle; have greater finesse and ease of handling; recovers energy at deceleration; recharges faster than an electric car; consumption is much lower.

A recent survey of 10,000 participants revealed that, despite the efforts of large companies for environmental protection, Toyota maintains the most eco-friendly image in the world. The first company to launch hybrid series models is Toyota. More than 20 years ago, in 1997, this important step was taken for Toyota. The launch was made in a market characterized as open to new trends and automotive technologies in Japan, and in 2001, the first hybrid model that was mass-produced began launching in the rest of the world (Toyota Motor Corporation, 2020).

Toyota has decided to create a new car that is both efficient in terms of fuel consumption and environmentally friendly. Toyota Prius has paved the way for a less polluted environment, which emits less pollutants and has low fuel consumption, it is the first mass-produced hybrid car in the world. Toyota Prius combines all qualities, is friendly with body size, has a great design, low fuel consumption, friendly with environmental and even social issues.

2. Research methodology

Absolute deviations are expressed as differences and refer to the absolute, value difference (plus or minus) of the value of an indicator in one period and in another. We will analyze the absolute deviations based on the chain (the current period will refer to the immediately preceding period).

Relative deviations are expressed in the form of reports and refer to the relative difference, percentage (plus or minus) of the value of an indicator in one period and in another period. We will analyze the relative deviations based on the chain (the current period will relate to the immediately preceding period).

Absolute and relative deviations, as a mechanism, are presented schematically as follows:

Absolute deviation (difference) Δ	With fixed base	$\Delta_n = \text{Value}_n - \text{Value}_0$
	With chain base	$\Delta_n = \text{Value}_n - \text{Value}_{n-1}$
Relative deviation (report) I	With fixed base	$I_n = \text{Value}_n / \text{Value}_0 \times 100$
	With chain base	$I_n = \text{Value}_n / \text{Value}_{n-1} \times 100$

*Table no.1. Absolute deviations and relative deviations
(Source: author's own processing)*

The rate of increase or decrease shall be expressed as a percentage, with the objective of increasing or decreasing the percentage, of an indicator at the level of one period compared to another previous period. We will analyze the rate of increase or decrease based on the chain (the current period will relate to the immediately preceding period) (Filip A.D., 2015).

The average rate of increase - decrease, as a mechanism, is presented schematically as follows:

Average increase / decrease rate Rc/s	With fixed base	Rc/s_n = Value_n/Value₀×100
	With chain base	Rc/s_n = Value_n/Value_{n-1}×100

*Table no.2. Average increase / decrease rate
(Source: author's own processing)*

The Pearson Coefficient or Correlation Index, as it is also called, translates a numerical index, which involves a correlative measure of the connection between two variables that are of a quantitative invoice, continuous or, conversely, discontinuous, not taking into account other types of variables. The formula for determining this correlation coefficient is highlighted in the following: (Filip A.D., 2015).

$$R = \frac{\Sigma (X-\bar{X}) \cdot (Y-\bar{Y})}{\sqrt{\Sigma (X-\bar{X})^2 \cdot \Sigma (Y-\bar{Y})^2}}$$

The interpretation of the result of the previously captured formula can be highlighted and highlighted with the help of the table delimited below, which automatically shows the ratio between the two variables, on the one hand, but also the value limitations or the correlation category between the two variables:

By deduction, starting from this correlation coefficient, a determination coefficient “d” can be determined automatically, this being captured with the help of a function, which defines by what percentages one of the variables implies it in a dynamic way on the other:

$$d = R^2$$

d = R²				
Pearson Coefficient	The ratio between the two variables	Value limit	The type of correlation	
	Directly proportional (Increasing one variable automatically generates the second increase / Decreasing one variable automatically generates decrease of the second)		0 ÷ 0,25	Low
			0,25 ÷ 0,50	Moderate
			0,50 ÷ 0,75	Good
			0,75 ÷ 1	Optimum
	Inverse proportional (Increasing one variable automatically generates the second decrease / Decreasing one variable automatically generates increase of the second)		0 ÷ -0,25	Low
			-0,25 ÷ -0,50	Moderate
			-0,50 ÷ -0,75	Good
		-0,75 ÷ -1	Optimum	

*Table no.3. Interpretation of Pearson-type correlations
(Source: author's own processing)*

In order to develop this material, a series of bibliographic sources were consulted, these belonging to Romanian or foreign authors, belonging to both the academic or business environment, but also virtual sources (Filip A.D., 2015).

3. Analysis of the obtained results

At the level of the period January 2016 - April 2020, at the level of the European market, the sales of Toyota hybrid cars are as follows:

Month/Year	2016	2017	2018	2019	2020
January	591	1272	1231	504	461
February	813	755	717	314	353
March	2239	2193	1588	853	389
April	1473	840	1111	504	169
May	1529	1249	1069	631	-
June	1638	1218	955	451	-
July	1565	1048	1026	860	-
August	1151	708	764	602	-
September	2040	1402	1352	907	-
October	1212	935	951	739	-
November	1215	1031	903	618	-
December	882	979	586	471	-

Table no. 4. Toyota hybrid car sales in the European market for the period January 2016 - April 2020
(Source: <https://carsalesbase.com/europe-toyota-prius/>, consulted on 01.06.2020)

Given that the last period analyzed is April 2020, a comparative evolution of sales in April for 2017-2020 would be as follows:

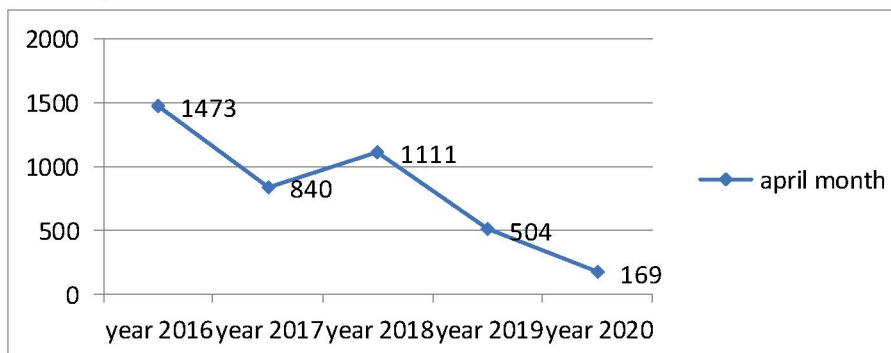


Fig. no.1: Toyota hybrid car sales in the European market for April for the period 2016-2020
(Source: author's own processing)

At the level of the European Union, the position held by the Lexus hybrid from Toyota, in a dynamic way, at the level of 2018 and 2019, is as follows:

16/01/2020

	December					Jan-Dec				
	%Share ¹		Units		%Change	%Share ¹		Units		%Change
	'19	'18	2019	2018	19/18	'19	'18	2019	2018	19/18
VW Group	22.9	23.0	277,930	229,491	+21.1	24.3	23.9	3,735,099	3,622,886	+3.1
VOLKSWAGEN	10.7	11.5	129,408	114,453	+13.1	11.2	11.3	1,715,366	1,710,252	+0.3
SKODA	4.5	4.5	54,596	44,611	+22.4	4.8	4.6	730,218	700,888	+4.2
AUDI	4.5	4.2	55,064	42,274	+30.3	4.7	4.6	716,780	700,433	+2.3
SEAT	2.6	2.4	31,754	23,663	+34.2	3.2	2.9	492,356	440,451	+11.8
PORSCHE	0.6	0.4	6,714	4,193	+60.1	0.5	0.4	75,149	66,192	+13.5
OTHERS ²	0.0	0.0	394	297	+32.7	0.0	0.0	5,230	4,670	+12.0
PSA Group	12.7	15.8	154,047	157,567	-2.2	15.9	16.2	2,433,781	2,460,302	-1.1
PEUGEOT	5.9	6.3	71,201	62,678	+13.6	6.2	6.3	952,358	956,275	-0.4
OPEL/VAUXHALL	2.9	5.4	34,847	53,669	-35.1	5.2	5.7	803,261	869,437	-7.6
CITROEN	3.5	3.8	42,793	38,086	+12.4	4.1	3.9	629,007	589,973	+6.6
DS	0.4	0.3	5,206	3,134	+66.1	0.3	0.3	49,155	44,617	+10.2
RENAULT Group	11.9	11.8	144,835	117,634	+23.1	10.6	10.6	1,631,512	1,613,549	+1.1
RENAULT	7.8	7.8	95,104	77,580	+22.6	6.8	7.2	1,049,498	1,087,686	-3.5
DACIA	4.0	4.0	48,888	39,571	+23.5	3.7	3.4	572,813	518,913	+10.4
LADA	0.0	0.0	431	271	+59.0	0.0	0.0	4,954	5,149	-3.8
ALPINE	0.0	0.0	412	212	+94.3	0.0	0.0	4,247	1,801	+135.8
HYUNDAI Group	6.2	6.4	75,863	64,273	+18.0	6.8	6.7	1,039,999	1,011,452	+2.8
HYUNDAI	3.5	3.4	42,655	34,357	+24.2	3.6	3.5	546,100	527,772	+3.5
KIA	2.7	3.0	33,208	29,916	+11.0	3.2	3.2	493,899	483,680	+2.1
BMW Group	7.6	8.0	92,861	79,776	+16.4	6.6	6.5	1,006,632	989,900	+1.7
BMW	6.1	6.1	73,842	60,878	+21.3	5.2	5.1	795,474	778,552	+2.2
MINI	1.6	1.9	19,019	18,898	+0.6	1.4	1.4	211,158	211,348	-0.1
DAIMLER	7.1	7.3	86,562	72,448	+19.5	6.4	6.2	984,781	935,057	+5.3
MERCEDES	5.9	6.6	71,318	65,729	+8.5	5.7	5.5	872,014	838,358	+4.0
SMART	1.3	0.7	15,244	6,719	+126.9	0.7	0.6	112,767	96,699	+16.6
FORD	6.1	6.2	74,049	61,975	+19.5	6.2	6.3	948,057	960,136	-1.3
FCA Group	5.6	6.0	67,944	59,721	+13.8	6.1	6.6	928,873	1,001,864	-7.3
FIAT	4.0	3.9	48,581	38,712	+25.5	4.2	4.6	651,080	701,750	-7.2
JEEP	0.9	1.2	11,128	12,229	-9.0	1.1	1.1	161,835	163,602	-1.1
LANCIA/CHRYSLER	0.3	0.4	3,925	4,362	-10.0	0.4	0.3	58,903	48,806	+20.7
ALFA ROMEO	0.3	0.4	3,896	3,873	+0.6	0.3	0.5	50,830	78,946	-35.6
OTHERS ³	0.0	0.1	414	545	-24.0	0.0	0.1	6,225	8,760	-28.9
TOYOTA Group	4.4	4.4	53,115	43,650	+21.7	5.0	4.8	767,903	731,976	+4.9
TOYOTA	4.0	4.0	48,510	40,312	+20.3	4.7	4.5	713,773	686,917	+3.9
LEXUS	0.4	0.3	4,605	3,338	+38.0	0.4	0.3	54,130	45,059	+20.1
NISSAN	2.6	2.6	32,082	25,753	+24.6	2.5	3.1	380,982	473,813	-19.6
VOLVO CAR CORP.	2.7	2.6	33,086	25,603	+29.2	2.1	2.0	323,293	300,702	+7.5
MAZDA	2.2	1.5	26,676	15,367	+73.6	1.6	1.5	246,788	223,782	+10.3
JAGUAR LAND ROVER Group	1.4	1.7	16,726	17,303	-3.3	1.4	1.5	218,987	229,250	-4.5
LAND ROVER	1.0	1.1	11,554	10,667	+8.3	1.0	1.0	147,357	148,790	-1.0
JAGUAR	0.4	0.7	5,172	6,636	-22.1	0.5	0.5	71,630	80,460	-11.0
MITSUBISHI	0.7	0.9	8,636	8,699	-0.7	0.9	0.9	138,003	133,438	+3.4
HONDA	0.8	0.8	9,575	7,729	+23.9	0.8	0.9	116,945	130,638	-10.5

SOURCE: ACEA MEMBERS

Table no. 5. The position held by the Toyota Lexus hybrid at the level of the European Union at the level of 2018 and 2019

(Source: https://www.acea.be/uploads/publications/ACEA_progress_report_2020.pdf)

Compared to traditional brands, however, we note the possession of a shy position, but in an upward trend.

At the level of the European Union, the correlation between the dynamics of Toyota hybrid car sales and foreign direct investments (FDI) will be made, as a concrete expression of globalization and globalization (Daiianu C, Abrudan D, 2017).

The dynamics of foreign direct investment (FDI) inflows in the European Union, in parallel with the sales of hybrid cars from Toyota are as follows (ACEA, 2020):

Year	2016	2017	2018	2019
FDI entries	635840	556118	340570	277640
Toyota hybrid sales	16348	13630	12253	7454

Table no.9. Dynamics of foreign direct investment (FDI) inflows and hybrid car sales in the European Union for the period 2016-2020 (Source: author's own processing)

The Pearson correlation performed at the level of FDI dynamics inputs and sales of hybrid cars in the European Union is as follows:

	FDI Inputs and Toyota Hybrid Sales
Pearson Index / Coefficient	0.91

Table no.10. Pearson correlation between foreign direct investment inflows (FDI) and sales of hybrid cars in the European Union for the period 2016-2020 (Source: author's own processing)

In the context of globalization, correlating the dynamics of foreign direct investment inflows with the dynamics of Toyota hybrid car sales, we note a Pearson coefficient of 0.91, positive, positioned in the value range (0.75-1) and thus indicating an optimal correlation, directly proportional, evidence that globalization, globalization and Toyota's access to the European market go hand in hand. The coefficient of determination or the mean square deviation R^2 , of 0.8255 indicates that, in the dynamics related to the interval 2016-2019, the two variables are interconditioned in proportion of 82.55 percent.

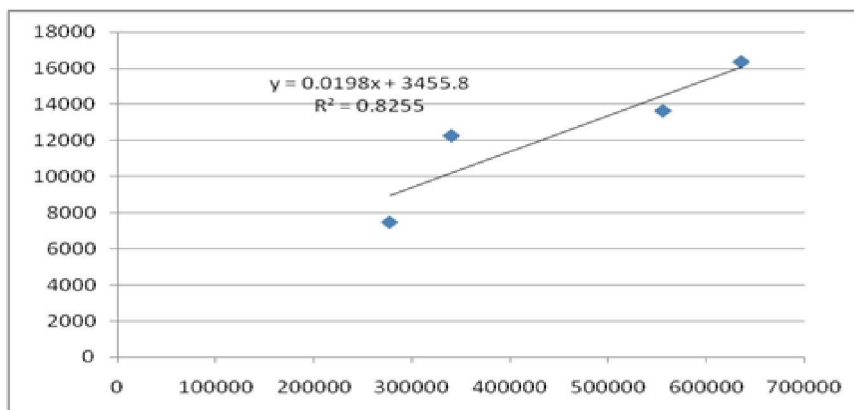


Fig. no.2. Pearson correlation between foreign direct investment inflows (FDI) and sales of hybrid cars in the European Union for the period 2016-2020 (Source: author's own processing)

The dynamics of the outflows of foreign direct investment (FDI) at the level of the European Union, in parallel with the sales of hybrid cars from Toyota are presented as follows (ACEA, 2020):

Year	2016	2017	2018	2019
FDI entries	654956	489526	412873	390388
Toyota hybrid sales	16348	13630	12253	7454

Table no.11. Dynamics of foreign direct investment outflows (FDI) and hybrid car sales in the European Union for the period 2016-2020
(Source: author's own processing)

The Pearson correlation performed at the level of FDI dynamics outputs and sales of hybrid cars at the level of the European Union is presented as follows:

	FDI Inputs and Toyota Hybrid Sales
Pearson Index / Coefficient	0.86

Table no. 12. Pearson correlation between foreign direct investment (FDI) outflows and hybrid car sales in the European Union for the period 2016-2020
(Source: author's own processing)

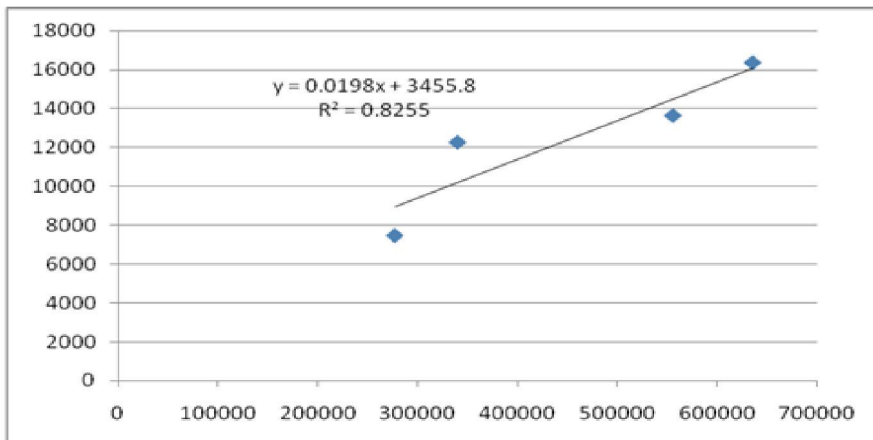


Fig.no.4. Pearson correlation between foreign direct investment (FDI) outflows and hybrid car sales in the European Union for the period 2016-2020
(Source: author's own processing)

In the context of globalization, correlating the dynamics of foreign direct outputs with the dynamics of Toyota hybrid car sales, we note a Pearson coefficient of 0.86, positive, positioned in the value range (0.75-1) and thus indicating an optimal correlation, directly proportional, evidence that globalization, globalization and Toyota's access to the European market go hand in hand. The coefficient of determination or the mean square

deviation R_2 , of 0.7452 indicates that, in the dynamics related to the interval 2016-2019, the two variables are interconditioned in proportion of 74.52 percent.

4. Conclusions

The last 20 years have caused globalization to erase national boundaries, and technology to change the notion of distance and time. Given these changes, companies want to develop the ability to control profits and risks, but at the same time to maintain their reputation. In fact, as a consequence of globalization, we find competition for investors or consumer loyalty and for the skilled workforce.

The way a company develops its relationships with employees, host communities or consumers can all be a way of contributing to a large extent to the success of the business (Daianu C, 2008).

In the business world, the biggest concern of companies, over time, has been making a profit and increasing values in the interest of shareholders. In other words, the only driving force was the financial responsibility of companies.

Contrary to this trend, in recent decades, a new "current" has grown, which has developed the scope of action of companies, it is about social responsibility, which involves the involvement of companies in the life of local communities, creating the best possible conditions for work and a developed interest in environmental protection, business ethics, etc.

This new concept for business development is also known as "Triple bottom line" (checking the results of companies in 3 directions, respectively the triple balance sheet), which emphasizes the main components affected by a company's activity: people, the natural environment and of course profit (in English "triple P - People, Planet, Profit").

Nowadays, the company's image, values and culture are given a fundamental importance. The involvement and support of projects of social interest is necessary to stabilize the commercial success, which comes bundled, guaranteed, with respect to the community in which the company operates.

In order to achieve the objectives, companies make donations, get involved in corporate volunteering and make sponsorships, set up foundations and carry out extensive marketing campaigns, all of which are part of the sphere of social responsibilities.

The vast majority of companies, especially large and medium-sized companies, have recognized that once they make a profit from economic activity, they must distribute it so as to maintain continuity in sustainable development and increase the image as favorable as possible among consumers.

The return of part of the profits, through contributions to the environment or by supporting various social causes, is a direct contribution to ensuring a favorable and open environment for their own products or services offered to the market, while serving as an advantageous way to differentiate from competitors.

The development of companies' interest in the environment was first developed through social responsibility events.

Some companies are investing in better and less polluting equipment. Others choose, on their own initiative, policies that are related to environmental protection, from stationery used in the company, to tree planting.

In the context of globalization, correlating the dynamics of foreign direct investment inflows with the dynamics of Toyota hybrid car sales in the European Union, we notice a Pearson coefficient of 0.91, positive, positioned in the value range (0.75-1) and thus indicating an optimal correlation, directly proportional, proof that globalization, globalization and Toyota's access to the European market go hand in hand. The coefficient of determination or the mean square deviation R_2 , of 0.8255 indicates that, in the dynamics related to the interval 2016-2019, the two variables are interconditioned in proportion of 82.55 percent.

In the context of globalization, correlating the dynamics of foreign direct outputs with the dynamics of Toyota hybrid car sales in the European Union, we notice a Pearson coefficient of 0.86, positive, positioned in the value range (0.75-1) and thus indicating an optimal correlation, directly proportional, proof that globalization, globalization and Toyota's access to the European market go hand in hand. The coefficient of determination or the mean square deviation R_2 , of 0.7452 indicates that, in the dynamics related to the interval 2016-2019, the two variables are interconditioned in proportion of 74.52 percent.

References

1. Dăianu D.C., Abrudan D., (2017), Considerations regarding the problematic factors in doing business in Central and East European EU member countries, , in Revista „Management Strategies/ Strategii manageriale”, Anul X, nr.IV(38)/2017, ISSN 2392-8123, ISSN-L 1844-668X, p. 49-60, Editura Independența Economică, Pitești.
 2. Dudă-Dăianu D.C. (2008), Investments in the new technologies – factor of economic development, Annual Session Of Scientific Papers "IMT ORADEA 2008, Annals of the Oradea University, Fascicle of Management and Technological Engineering, CD-ROM Edition, Volume VII (XVII), p.2153-2158, Editura Universității din Oradea, ISSN 1583-0691, Arad, CNCSIS B+;
 3. European Automobile Manufacturers Association (ACEA), (2020), Making the transition to zero emission mobility, 2020 Progress Report, October 2020, https://www.acea.be/uploads/publications/ACEA_progress_report_2020.pdf
 4. European Automobile Manufacturers Association (ACEA), (2020), The future of the EU auto industry, Manifesto 2019-2024, https://www.acea.be/uploads/publications/ACEA_manifesto_2019-2024.pdf
 5. Filip, A. D. (2015), Statistică inferențială, Universitatea ”Babeș Bolyai”, Cluj-Napoca.
- Toyota Motor Corporation (2020), Environmental Report in the Sustainability Data Book and reports on Toyota's Environmental (E) initiatives, November no. 04/2020, https://global.toyota/pages/global_toyota/sustainability/report/er/er20_en.pdf.